

Who's in your family tree?

Part 2. the Pea family

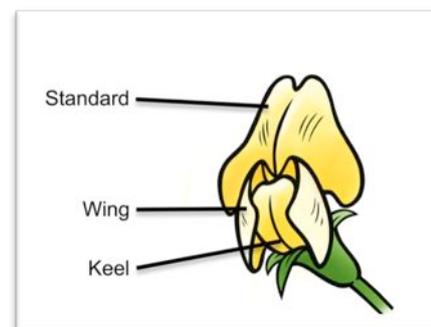
If you have ever noticed a pea pod in your garden then you'll be able to recognise any member of the Pea family. The family has evolved into one of the largest in the plant world with around 13,000 known species. They vary from low-lying clovers to climbing beans and charismatic savannah Acacia trees. They are an important economic group forming some very significant food plants such as soybean, chickpea, alfalfa, peanut, carob and liquorice as well as providing important fodder, timber and oil products too. Common to all members of the family are a one-chambered pod, called a legume. Their tap-roots also bear nodules that house a special group of nitrogen-fixing bacteria. These bacteria are known as rhizobia and are capable of 'fixing' nitrogen from the air and turning it into useable forms of nitrogen such as ammonia and nitrates. This relationship is a mutually beneficial, symbiotic relationship in which the plants provide carbohydrates, obtained from photosynthesis, in exchange for fixed nitrogen. Due to this relationship legumes are able to grow in relatively poor soils and gain an advantage over other plants unable to grow in such conditions.

Leaves and branches

The leaves are generally in one of two forms; simple or compound. Simple leaves are a single leaf that is never divided into smaller leaflets. Compound leaves, such as pinnate leaves, are divided into leaflets arising on both sides of the midrib. The Pea family also has some divided into three leaflets known as trifoliate which is a key characteristic of clovers. Some leaves have become specialised forming spirally arranged tendrils used to by climbing plants for support.

Flowers

The flowers of the Pea family are unique and fairly distinctive. They are described as being irregular in shape with a 'bilateral' symmetry like that of a butterfly or open book. The illustration below shows the flower design with parts including standard, keel and wing. The flowers are all hermaphrodite containing both male and female parts and are often colourful attracting insect pollinators such as bees and butterflies.



Fruits

The fruits are also very distinctive. If you have shedded peas from a pod then you will be familiar with the fruit and pod design. The pods always split along the seams which connect the two sides. They generally burst open when dry to scatter the developed seed. Be warned though as some species are edible whereas others are poisonous (boiling often denatures the toxins in beans).

History

The first beans began to be cultivated over 6000 years ago placing them among the world's first domesticated plants. Beans are among the simplest plants to grow and are considered an excellent source of protein though often being associated with poverty and a 'poor man's meat'. Explorers brought dried peas to America in the 17th century at the same time traders introduced sugar peas to China and Japan. Peas and beans have been employed in a variety of activities other than cooking. Dried beans served as ballots in ancient Greek and Roman tradition; white beans for acceptance, black beans for rejection of a motion. Native Americans developed a catalogue of medical applications for different beans ranging from skin care to snake bites. The most widely used beans include; French beans, kidney beans, runner beans and string beans. When combined with tomato sauce any of these beans can be cooked together to

create the classic American dish, baked beans! Pease pudding is a traditional British dish, often eaten with salt pork, which dates back to the Middle Ages. Puddings in those days were a mixture of split green peas and various chopped ingredients using suet as a binder. This mixture was gathered in a linen pudding cloth and cooked in a boiling cauldron that hung over a fire.

Below are a few of the many plants in this group that are common in the UK and across the European continent.



Liquorice Milk-vetch (*Astragalus glycyphyllos*)

This plant can be found in grasslands and hedges in the UK and across Europe. It is cultivated as a fodder crop but although its leaves have a sweet, slightly liquorice taste the plant commercially used to produce liquorice is Sweet liquorice, native to the Middle East.



Red Clover (*Trifolium pratense*)

A common plant of all grassy areas from lawns to meadows. It is sown as a fodder crop and is used in crop rotation systems because of its ability to enrich soils with nitrogen. It is used in herbal medicine to treat respiratory and skin disorders and also for symptoms of the menopause.



Mountain Sainfoin (*Onobrychis montana*)

A colourful plant found on grassy and rocky places. It's leaves are a rich pink with purplish veins and its fruits develop into rounded pods. Sainfoin has a fodder value equal to alfalfa and is a preferred food by cows.



Bird's-foot Trefoil (*Lotus corniculatus*)

Locally known as 'eggs & bacon' for its yellow flowers and reddish buds this is a widespread and common plant. It can be found across grassy sand-dunes to heathlands. The seed pods curl as they dry resembling claw and have been given the name 'Grannies toenails'!



Alpine Milk-vetch (*Astragalus alpinus*)

This is a very hardy plant found across Arctic and alpine environments on scree and other rocky ground. As such it is very rare in the UK being located in just 4 sites in the tundra environment of the Scottish Highlands. Some species of Milk-vetch are poisonous to domestic cattle but species such as Arctic hare and Reindeer graze on it.



European Gorse (*ulex europaeus*)

This robust shrub is a common sight from coastal grasslands and dry moorland as well as in towns and gardens. It flowers in early spring through the summer whereas its close relative, Western Gorse flowers in the autumn. It has needle-like leaves and its yellow flowers give a sweet coconut scent. Its uses include fuel for bread ovens and a yellow dye was extracted from the flowers.



Laburnum (*Laburnum anagyroides*)

A small tree which was introduced to the UK in the 16th century. It is planted as an ornamental tree in parks and gardens and produces large, drooping bunches of bright, yellow flowers. The flowers develop in May and June and give rise to its common name 'Golden rain'. All parts of the tree are extremely poisonous.



Garden Lupin (*Lupinus polyphyllus*)

Originating in North America it has been widely introduced around the world as an ornamental plant. Its ability to grow in poor soil and to spread rapidly has seen it outcompete native plants and in many places it has become a nuisance. In New Zealand for instance it is classified as an invasive species.

Mountain Milk-vetch (*Oxytropis jacquinii*)

A plant of meadows and rocky places, especially on Limestone. It can be found across the Alps and the Jura mountains. The name *Oxytropis* comes from 'oxys' meaning sharp and 'tropis' meaning tip and refers to the narrow keel flower ending in a small point.



Umbrella Thorn (*Acacia tortilis*)

This tree is very common across east Africa and grows to 18m. Due to its ability to withstand a wide range of soil moisture conditions it can be found growing from 600m – 2000m altitude. It is an excellent fuel and is used in the tanning industry due to the acids in its bark, and also in live fencing where its dense and long thorns help to keep predators away from livestock.



Brown Clover (*Trifolium badium*)

This plant is common across the continent but absent from the British Isles. It has a spreading habit and can often form a low-lying carpet in open meadows. The golden yellow flowers turn chestnut-brown as the seeds develop.

Bio:
Jim Langley runs Nature's Work an educational consultancy specialising in outdoor and environmental learning. He holds the International Mountain Leader qualification and runs professional development courses for those wishing to learn more about the natural world. These courses form CPD events for the MTA and BAIML. More information can be found at www.natureswork.co.uk